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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,808	08/20/2002	Ronald Scott Bunker	120478	7768

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
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NISKAYUNA, NY 12309

EXAMINER	
PARSONS, THOMAS H	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 12/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/064,808	BUNKER, RONALD SCOTT	
	Examiner	Art Unit	
	Thomas H. Parsons	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 August 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 0827>002
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. **Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated.** See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. **The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "300" as shown in Figures 3, 5, and 12; and, "250" as shown in Figures 6 and 10.** Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be

notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. **The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:**

"105" as mentioned on page 7, paragraph [0028], line 3;

"113" as mentioned on page 7, paragraph [0028], line 11; and,

"320" as mentioned on page 7, paragraph [0029], line 7.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. **The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character ""251"" has been used to designate both flow regulator and control sensor.** Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion

of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. **The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "251" and "211" have both been used to designate control sensor.** Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:

Page 4, paragraph [0022], lines 7 and 8, suggest changing "315" to --310--; and,

Page 5, paragraph [0024], line 3, suggest changing "110" to --230--, and "230" to --110--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-4, 9, 13, 21-23, 25, 32-34, 38, 40-41 have been rejected under 35 U.S.C. 102(b) as being anticipated by JP10-255827.

Claim 1: JP10-255827 discloses in Figures 1-3 a fuel cell assembly comprising: a housing having an inlet and an outlet and defining at least one bypass flow channel, the bypass flow channel being configured to be in fluid communication with the inlet, the inlet and outlet being configured to provide fluid communication to and from the housing, respectively; at least one fuel cell stack (1^1-1^N) disposed within the housing and defining at least one direct flow channel, the at least one fuel cell stack comprising at least one fuel cell (1^1), and the direct flow channel being configured to be in fluid communication with the inlet and outlet; and a control system (5), which is configured to control an oxidant flow (3) from the inlet to the direct and bypass flow channels (abstract).

Claims 2 and 22: JP10-255827 discloses in Figures 1-3 a bypass flow channel further configured to be in fluid communication with the outlet (abstract).

Claims 3 and 25: JP10-255827 discloses in Figures 1-3 a control system configured to adjust the oxidant flow to the direct and bypass flow channels in response to a feedback signal (i.e. abnormality detecting device 4 is inputted to a bypass and direct control valve) (abstract).

Claim 4: JP10-255827 discloses in Figures 1-3 a control system comprising: at least one flow regulator (11^1, 9^1), which is configured to regulate the oxidant flow to the direct and bypass flow channels; a flow controller (5), which is configured to receive the feedback signal and to actuate the at least one flow regulator; and at least one control sensor (4), which is configured to supply the feedback signal to the flow controller.

Claim 9: JP10-255827 discloses in Figures 1-3 a flow regulator comprising at least one control valve (11 and 9).

Claim 13: JP10-255827 discloses in Figures 1-3 an inlet configured to be in fluid communication with a preceding outlet of a preceding fuel cell assembly.

Claims 21 and 23: JP10-255827 discloses in Figures 1-3 a fuel cell assembly comprising: a housing having an inlet and an outlet, the inlet and outlet being configured to provide fluid communication to and from the housing, respectively; at least one bypass flow duct extending along the housing and configured to be in fluid communication with the inlet; at least one fuel cell stack (1^1-1^N) disposed within the housing and defining at least one direct flow channel, the at least one fuel cell stack comprising at least one fuel cell (1^1), and the direct flow channel being configured to be in fluid communication with the inlet and outlet; and a control system (5), which is configured to control an oxidant flow (3) from the inlet to said direct flow channel and the bypass flow duct (abstract); and wherein the bypass flow duct extends along an outer wall of the housing.

Claim 32: JP10-255827 discloses in Figures 1-3 a method for controlling a thermal environment of a fuel cell stack, the fuel cell stack comprising at least one fuel cell, being disposed within a housing and having at least one direct flow channel, the housing having an

inlet and an outlet, and the inlet being in fluid communication with the direct flow channel and with a bypass flow channel, said method comprising: apportioning an oxidant flow between the direct and bypass flow channels.

Although the method of JP10-255827 does not specifically disclose controlling a thermal environment, the method of JP10-255827 is the same as that instantly disclosed. Accordingly, the method steps would control a thermal environment.

Claim 33: JP10-255827 discloses in Figures 1-3 adjusting the oxidant flow through the direct and bypass flow channels in response to a feedback signal output.

Claim 34: JP10-255827 discloses in Figures 1-3 monitoring the thermal environment of the fuel cell stack to generate the feedback signal output; and actuating at least one flow regulator positioned at the inlet in response to the feedback signal output, the flow regulator being configured to alter the oxidant flow from the inlet to the direct and bypass channels.

Claim 38: JP10-255827 discloses in Figures 1-3 monitoring the thermal environment of the fuel cell stack to generate the feedback signal output; and actuating at least one flow regulator positioned upstream of the fuel cell stack, in response to the feedback signal output, the flow regulator being configured to apportion the oxidant flow through the direct and bypass channels. **Claim 40**: JP10-255827 discloses in Figures 1-3 a fuel cell assembly comprising: a housing having an inlet and an outlet and defining at least one bypass flow channel, which is configured to be in fluid communication with the inlet and the outlet, the inlet and outlet being configured to provide fluid communication to and from the housing, respectively; at least one fuel cell stack (1^1-1^N) disposed within the housing and defining at least one direct flow channel, the at least one fuel cell stack comprising at least one fuel cell (1^1), and the direct flow channel

being configured to be in fluid communication with the inlet and outlet; and a control system (5), which is configured to control an oxidant flow (3) through the direct and bypass flow channels.

Claim 41: The rejection of claim 41 is as set forth above in claim 4.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claims 1-4 above, and further in view of JP9-223512.

JP10-255827 is as applied, argued, and disclosed above and incorporated herein.

Claims 5 and 6: JP10-255827 does not disclose a control sensor (abnormality detecting device) configured to monitor a parameter selected from the group consisting of temperature, voltage, electrical current, and heat flux; and, wherein said control sensor comprises a temperature sensor.

JP9-223512 in Figure 1 discloses a control sensor (abnormality detecting device) configured to monitor temperature and, wherein the control sensor comprises a temperature sensor (a thermocouple)(abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control sensor of JP10-255827 by incorporating the

control sensor of JP9-223512 because JP9-223512 teaches a control sensor that would have provided a means for measuring temperature and load current variations in a fuel cell thereby providing a means for improving the overall operating efficiency and control of the fuel cell.

11. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claims 1-4 above, and further in view of JP9-223512 as applied to claims 5-6 above, and further in view of Applicants' admitted prior art.

JP10-255827 and JP9-223512 are as applied, argued, and disclosed above, and incorporated herein.

Claims 7 and 8: The JP10-255827 combination does not disclose an invasive temperature sensor and a non-invasive temperature sensor.

The Applicant discloses in paragraph [0025] known invasive temperature sensors, which are in intimate contact with a downstream control point, and non-invasive temperature sensor, which are in remote communication with an upstream control point.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention made to have modified the control sensor of the JP10-255827 combination by incorporating the control sensors of the Applicants' admitted prior art because the Applicant discloses known control sensor that would have provided temperature detection at an upstream control point and a downstream control point thereby providing a means for improving the overall operating efficiency and control of the fuel cell.

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claims 1 and 2 above, and further in view of Williams et al. (5,413,878).

JP10-255827 is as applied, argued, and disclosed above, and incorporated herein.

Claim 12: JP10-255827 does not disclose an outlet configured to be in fluid communication with a subsequent inlet of a subsequent fuel cell assembly.

Williams et al. in Figure 6 disclose an outlet configured to be in fluid communication with a subsequent inlet of a subsequent fuel cell assembly (col. 10: 34-col. 12: 32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was mad to have modified the apparatus of JP10-255827 by incorporating the outlet of Williams et al. because Williams et al. teach a fluid-flow (i.e. networking arrangement) arrangement in which inlet process fluid flows are controlled by recycling a portion of the product systems streams flowing from network devices thereby improving overall operating efficiency and fuel utilization, and enhancing the overall control scheme.

13. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claims 1 and 2 above, and further in view of EP0374368.

JP10-255827 is as applied, argued, and disclosed above, and incorporated herein.

Claims 14 and 15: JP10-255827 does not disclose a housing configured to be pressurized, and wherein the inlet is configured to be in fluid communication with a preceding outlet of a turbine engine, and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine.

EP0374368 in the Figure discloses a housing (20) configured to be pressurized, and wherein the inlet is configured to be in fluid communication with a preceding outlet of a turbine

(16) engine, and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine (16) (col. 3: 6-8 and 22-25) (See also col. 3: 1-col. 4: 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of JP10-255827 with the pressurized housing and turbine of EP0374368 because EP0374368 discloses a pressurized housing and turbine that would have provided a pressurized environment for electrochemically reacting a pressurized oxidant stream thereby improving the overall operating efficiency and power density of the fuel cell.

14. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claim 1 above, and further in view of Scheffler et al. (4,859,545).

JP10-255827 is as applied, argued, and disclosed above, and incorporated herein.

Claim 16: JP10-255827 does not disclose a bypass flow channel configured to recycle at least a portion of the oxidant flow through the bypass flow channel to an inlet.

Scheffler et al. in the Figure disclose a bypass flow channel (24) configured to recycle at least a portion of the oxidant flow through the bypass flow channel to an inlet (18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of JP10-255827 by incorporating the bypass flow channel of Scheffler et al. because Scheffler et al. teach a bypass flow channel that would provided a means for regulating the total oxygen content entering the cathode side of a fuel cell when the stack is operating at partial power levels thereby improving the overall performance of the fuel cell stack.

15. Claims 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claim 1 above, and further in view of Applicant's admitted prior art.

JP10-255827 is as applied, argued, and disclosed above, and incorporated herein.

Claims 17, 19 and 20: JP10-255827 discloses a fuel cell system but does not disclose cells selected from the group consisting of a solid oxide fuel cell, a proton exchange membrane fuel cell, a molten carbonate fuel cell, a phosphoric acid fuel cell, an alkaline fuel cell, a direct methanol fuel cell, a regenerative fuel cell, a zinc air fuel cell, and a protonic ceramic fuel cell; wherein said at least one fuel cell stack comprises a plurality of planar fuel cells arranged in a stack; and, wherein said at least one fuel cell stack comprises a plurality of fuel cells arranged in a tubular configuration.

The Applicant discloses in paragraphs [0002] and [0021] known fuel cells consisting of a solid oxide fuel cell, a proton exchange membrane fuel cell, a molten carbonate fuel cell, a phosphoric acid fuel cell, an alkaline fuel cell, a direct methanol fuel cell, a regenerative fuel cell, a zinc air fuel cell, and a protonic ceramic fuel cell; wherein said at least one fuel cell stack comprises a plurality of planar fuel cells arranged in a stack; and, wherein said at least one fuel cell stack comprises a plurality of fuel cells arranged in a tubular configuration.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell system of JP10-255827 with known fuel cells as disclosed in the Applicant's admitted prior art because the Applicant discloses known fuel cells of a specific type and configuration that would have provided energy conversion devices that operate at high efficiency and low pollution thereby providing cost advantages.

16. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claim 1 above, and further in view of Applicant's admitted prior art as applied to claim 17 above, and further in view of EP0374368.

JP10-255827 and Applicant's admitted prior art are as applied, argued and disclosed above, and incorporated herein.

Claim 18: The JP10-255827 combination does not disclosed a pressure vessel.

EP0347368 in the Figure discloses a housing (20) configured to be pressurized (col. 3: 1-col. 4: 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of JP10-255827 combination with the pressurized housing of EP0374368 because EP0374368 discloses a pressurized housing that would have provided a pressurized environment for electrochemically reacting a pressurized oxidant stream thereby improving the overall operating efficiency and power density of the fuel cell.

17. Claims 26-27, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP255827 in view of Applicants admitted prior art, and in view of EP0374368.

Claims 26, 27, 30 and 31: JP255827 in Figures 1-3 discloses a fuel cell assembly comprising a housing having an inlet and an outlet and defining at least one bypass flow channel, the bypass flow channel being configured to be in fluid communication with the inlet, the inlet and outlet being configured to provide fluid communication to and from the pressure vessel

respectively and a fuel cell stack disposed within the housing and defining at least one direct flow channel and the direct flow channel being configured to be in fluid communication with the inlet and outlet.

JP10-255827 does not disclose a housing configured to be pressurized, and wherein the inlet is configured to be in fluid communication with a preceding outlet of a turbine engine, and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine.

EP0374368 in the Figure discloses a housing (20) configured to be pressurized, and wherein the inlet is configured to be in fluid communication with a preceding outlet of a turbine (16) engine, and wherein the outlet is configured to be in fluid communication with a subsequent inlet of a turbine engine (16) (col. 3: 6-8 and 22-25) (See also col. 3: 1-col. 4: 15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of JP10-255827 with the pressurized housing and turbine of EP0374368 because EP0374368 discloses a pressurized housing and turbine that would have provided a pressurized environment for electrochemically reacting a pressurized oxidant stream thereby improving the overall operating efficiency and power density of the fuel cell.

The JP10-255827 combination does not disclose a planar solid oxide cell stack, and a plurality of planar solid oxide fuel cells arranged in a stack.

The Applicant discloses in paragraphs [0002] and [0021] known fuel cells consisting of a solid oxide fuel cell; and, wherein said at least one fuel cell stack comprises a plurality of planar fuel cells arranged in a stack.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell system of JP10-255827 combination with known fuel cells as disclosed in the Applicant's admitted prior art because the Applicant discloses known fuel cells of a specific type and configuration that would have provided energy conversion devices that operate at high efficiency and low pollution thereby providing cost advantages.

18. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP255827 in view of Applicants admitted prior art, and further in view of EP0374368, and further in view of JP9-223512.

Claims 28 and 29: JP10-255827, Applicant's admitted prior art and EP0347368 is as applied, argued, and disclosed above and incorporated herein, and wherein further JP10-255827 discloses control system configured to repeatedly monitor feedback signals and comprising: a flow regulator (11, 9), which is configured to regulate the oxidant flow (3) to the direct and bypass flow channels; a flow controller (5), which is configured to communicate a feedback signal and to actuate the at least one flow regulator, and at least one control sensor (abnormality detector), which is configured to generate the feedback signal from at least one control point and communicate the feedback signal to the flow controller.

The JP10-255827 combination does not disclose a control sensor (abnormality detecting device) configured to monitor temperature wherein said control sensor comprises a temperature sensor.

JP9-223512 in Figure 1 discloses a control sensor (abnormality detecting device) configured to monitor temperature and, wherein the control sensor comprises a temperature sensor (a thermocouple)(abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control sensor of JP10-255827 combination by incorporating the control sensor of JP9-223512 because JP9-223512 teaches a control sensor that would have provided a means for measuring temperature and load current variations in a fuel cell thereby providing a means for improving the overall operating efficiency and control of the fuel cell.

18. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claim 32 above, and further in view of Scheffler et al. (4,859,545).

JP10-255827 is as applied, argued, and disclosed above, and incorporated herein.

Claim 39: JP10-255827 does not disclose a bypass flow channel configured to recycle at least a portion of the oxidant flow through the bypass flow channel to an inlet.

Scheffler et al. in the Figure disclose a bypass flow channel (24) configured to recycle at least a portion of the oxidant flow through the bypass flow channel to an inlet (18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of JP10-255827 by incorporating the bypass flow channel of Scheffler et al. because Scheffler et al. teach a bypass flow channel that would provided a means for regulating the total oxygen content entering the cathode side of a fuel cell

when the stack is operating at partial power levels thereby improving the overall performance of the fuel cell stack.

19. Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claims 32-34 above, and further in view of JP9-223512, and further in view of Applicant's admitted prior art.

JP10-255827 is as applied, argued, and disclosed above, and incorporated herein.

Claims 35-37: JP10-255827 does not disclose measuring a parameter selected from the group consisting of temperature, voltage, current and heat flux.

JP9-223512 in Figure 1 discloses a control sensor (abnormality detecting device) configured to monitor temperature and, wherein the control sensor comprises a temperature sensor (a thermocouple)(abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control sensor of JP10-255827 combination by incorporating the control sensor of JP9-223512 because JP9-223512 teaches a control sensor that would have provided a means for measuring temperature and load current variations in a fuel cell thereby providing a means for improving the overall operating efficiency and control of the fuel cell.

The JP10-255827 combination does not discloses measuring a plurality of times to obtain a measured parameter, comparing the measured parameter with a predetermined parameter value, and comparing the valued with a predetermined temperature value.

The Applicant in paragraph [0026] discloses "As is known to those skilled in the art, control systems process and compare feedback signals in a variety of ways and the present invention is not limited to any particular signal processing scheme."

Therefore, in light of the Applicant's teaching of known control systems, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the control system to provide the claimed measuring and comparing of feedback signals because the Applicant teaches known control systems that would have enhanced the overall fuel cell control scheme thereby improving overall efficiency.

20. Claim 10, 11 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP10-255827 as applied to claim 1 and 21 above, and further in view of Gillett et al.

JP10-255827 is as applied, argued, and disclosed above, and incorporated herein.

Claims 10, 11 and 24: JP10-255827 does not disclose a bypass oxidant flow channel extending along an inner surface of the housing, disposed within the housing, or flow liner.

Gillett et al. in Figures 2 and 4 disclose a housing enclosing fuel cell stack assembly modules including flow ducts. Gillett et al. disclose that ducting can be on the sides, top or bottom of the module housing, and any suitable ducting is within the invention. Gillett also discloses that thermal insulation (which has been construed as a flow liner) is disposed within the housing and that ducting disposed between said flow liner and said housing and extends along an inner surface of said housing.

Therefore, it would have been within the skill of the art at the time the invention was made to have modified the housing of JP10-255827 by incorporating the housing of Gillett et al.

because Gillett et al. teach a housing for a fuel cell module that would have provided a totally pressurized or non-pressurized enclosed system for the fuel cells including direct and bypass ducting and a liner that would have prevented high temperatures at the vessel wall thereby improving the functionality of the system, and overall performance and efficiency of the power generating system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas H. Parsons whose telephone number is (571) 272-1290. The examiner can normally be reached on M-F (7:00-4:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas H Parsons
Examiner
Art Unit 1745

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